

Remarks

I. Status of claims

Claims 1-20 were pending.

Claims 1, 4-7, 9, 10, 17, and 19 have been amended. Claim 4 has been written in independent form, and claim 9 have been amended and now depends from claim 4.

Claim 18 has been canceled.

Claims 21 and 22 have been added.

II. Objections to the drawings

FIG. 2A has been amended as requested by the Examiner. The Examiner's objections to the drawings now should be withdrawn.

III. Claim rejections under 35 U.S.C. § 103(a)

A. Claims 1-3,8, 10-17, 19

The Examiner has rejected claims 1-3, 8, and 10-16 under 35 U.S.C. § 103(a) over Buescher (US 6,396,351) in view of North (US 6,118,829).

Claim 1

Claim 1 has been amended and now recites that the fiber optic receiver comprises a receiver optical sub-assembly (ROSA) and a mode selection circuit located outside of the ROSA. The ROSA comprises a lens assembly and houses an opto-electronic transducer and an adjustable response preamplifier circuit. Transmitting the mode control signal from a mode selection circuit located outside of the ROSA allows an adjustable response preamplifier to be incorporated within the ROSA while conforming to ROSA size and pin count constraints that are imposed required by many fiber optic receiver designs.

As explained in detail below, none of the cited references taken alone or in any permissible combination teaches or suggests the inventive fiber optic receiver now recited in claim 1.

Beuscher

Buescher discloses a preamplifier circuit for a photodetector. As acknowledged by the Examiner, Buescher fails to teach anything about a mode selection circuit. Beuscher also fails to teach or suggest anything about a receiver that comprises a ROSA comprising a lens assembly, and housing an opto-electronic transducer and an adjustable response preamplifier circuit, much less anything about a receiver that comprises such a ROSA and a mode selection circuit located outside of the ROSA, as now recited in claim 1.

North

North discloses two receiver circuit embodiments 200, 450 each of which includes a respective amplifier 210, 454 and a respective mode selection circuit 240, 470 for adjusting the response bandwidth and input sensitivity of the amplifier. North does not teach or suggest anything about a ROSA comprising a lens assembly, and housing an opto-electronic transducer and an adjustable response preamplifier circuit, much less anything about a receiver that comprises such a ROSA and mode selection circuit located outside of the ROSA, as now recited in claim 1. Indeed, North shows that in each receiver circuit embodiment the mode selection circuit and the amplifier are incorporated in the same circuit. One of ordinary skill in the art at the time of the invention would understand from North's disclosure that the mode selection circuit and the amplifier are formed on the same integrated circuit (IC) die. Thus, North teaches away from a fiber optic receiver having a ROSA housing a receiver, and a mode selection circuit located outside of the ROSA, as now recited in claim 1.

Jiang

The Examiner has cited Jiang (US 2002/0076173) for the proposition that "Jiang disclosed integrating a preamplifier, postamplifier, receiver and connector on a common substrate (PCB)." Each of Jiang's embodiments includes a ROSA implemented in the form of a TO can package (see, e.g., paragraph [0027]) and an associated lens. In each of these embodiments, however, the TO can package only contains a photodetector. Jiang fails to teach or suggest anything about a ROSA that houses any kind of amplifier circuit, much less anything about a ROSA that houses an adjustable response preamplifier circuit as recited in claim 1. Indeed, Jiang teaches that the preamplifier and postamplifier are integrated on the same receiver integrated circuit (see paragraph [0028]) that is mounted outside of the TO can package on the opposite side of the printed circuit board 108 (see FIG. 1).

Conclusion

In sum, none of the cited references individually teaches or suggests a fiber optic receiver that comprises a ROSA that houses an adjustable response preamplifier circuit, and a mode selection circuit that is located outside of the ROSA. Therefore, no permissible combination of the cited references could possibly have led one of ordinary skill in the art at the time of the invention to the inventive fiber optic receiver now recited in claim 1. For at

least these reasons, the Examiner's rejection of claim 1 under 35 U.S.C. § 103(a) now should be withdrawn.

Claims 2, 3, 8, and 10-16

Each of claims 2, 3, 8, and 10-16 incorporates the features of independent claim 1 and therefore is patentable for at least the same reasons explained above.

Claims 17 and 19

The Examiner has rejected claims 17 and 19 under 35 U.S.C. § 103(a) over Buescher in view of North and Jiang (US 2002/0076173).

Claims 17 and 19 incorporate the features of independent claim 1. As explained in detail above, Jiang does not make up for the failure of Buescher and North to teach or suggest a fiber optic receiver that comprises a ROSA that houses an adjustable response preamplifier circuit, and a mode selection circuit that is located outside of the ROSA. Therefore, claims 17 and 19 are patentable for at least the same reasons explained above

B. Claims 4-7 and 9

The Examiner has rejected claims 4-7 and 9 under 35 U.S.C. § 103(a) over Buescher in view of North.

Claim 4

Claim 4 has been written in independent form and now recites that the mode selection circuit is configured to modulate the mode control signal onto at least one common line coupled between the preamplifier circuit and the post-amplifier circuit.

As explained in detail below, none of the cited references taken alone or in any permissible combination teaches or suggests the inventive fiber optic receiver now recited in claim 4.

Buescher

As acknowledged by the Examiner, Buescher fails to teach anything about a mode selection circuit for a preamplifier circuit of a fiber optic receiver.

North

Regarding claim 4, the Examiner has indicated that North teaches a mode selection circuit that is configured to modulate a mode control signal onto a common line coupled between a preamplifier circuit and a post-amplifier circuit. In each of North's embodiments, however, the mode control signal (labeled "MODE" in FIGS. 2 and 4) is not modulated onto a line coupled between a preamplifier circuit and a post-amplifier circuit.

Indeed, in the embodiment of FIG. 2, the only line coupled between the amplifier 210 and the comparator amplifier 220 is the line labeled I_{OUT} . In this embodiment, the MODE signal is not transmitted over the I_{OUT} line. Rather, this MODE signal is transmitted over a line connected to switch 230 and a line connected to variable voltage reference 214. Neither of these lines is coupled between the amplifier 210 and the comparator amplifier 220.

Similarly, in the embodiment of FIG. 4, the only line coupled between the amplifier 454 and the comparator amplifier 458 is the line labeled V_{OUT} . In this embodiment, the MODE signal is not transmitted over the I_{OUT} line. Rather, this MODE signal is transmitted over a line connected to the AGC control circuit 456, which is not coupled between the amplifier 210 and the comparator amplifier 220.

Jiang

Jiang fails to teach anything about a mode selection circuit for a preamplifier circuit of a fiber optic receiver.

Conclusion

In sum, none of the cited references individually teaches or suggests a mode selection circuit that is configured to modulate the mode control signal onto at least one common line coupled between the preamplifier circuit and the post-amplifier circuit. Therefore, no permissible combination of the cited references could possibly have led one of ordinary skill in the art at the time of the invention to the inventive fiber optic receiver now recited in claim 4. For at least these reasons, the Examiner's rejection of claim 4 under 35 U.S.C. § 103(a) now should be withdrawn.

Claims 5-7 and 9

Each of claims 5-7 and 9 incorporates the features of independent claim 4 and therefore is patentable for at least the same reasons explained above.

C. Claim 20

The Examiner has rejected claim 20 under 35 U.S.C. § 103(a) over Buescher in view of North and Jiang.

Claim 20, which has not been amended, recites that an adjustable response preamplifier circuit is incorporated within a ROSA that is mounted on a substrate, and that a post-amplifier circuit is mounted on the substrate and configured to transmit a mode control signal to the preamplifier circuit over one or more common lines coupled between the preamplifier circuit and the post-amplifier circuit.

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For the same explained above in connection with claim 1, none of the cited references individually teaches or suggests a fiber optic receiver that comprises a ROSA incorporating an adjustable response preamplifier circuit, and a post-amplifier circuit mounted on a substrate on which the ROSA is mounted. Therefore, no permissible combination of the cited references could possibly have led one of ordinary skill in the art at the time of the invention to the inventive fiber optic receiver recited in claim 20.

In addition, for the same reasons explained above in connection with claim 4, none of the cited references individually teaches or suggests a post-amplifier circuit that is configured to transmit a mode control signal over one or more common lines coupled between the preamplifier circuit and the post-amplifier circuit. Therefore, no permissible combination of the cited references could possibly have led one of ordinary skill in the art at the time of the invention to the inventive fiber optic receiver now recited in claim 20.

For at least these reasons, the Examiner's rejection of claim 20 under 35 U.S.C. § 103(a) now should be withdrawn.


IV. Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 50-1078.

Respectfully submitted,

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Annotated Sheet Showing Changes

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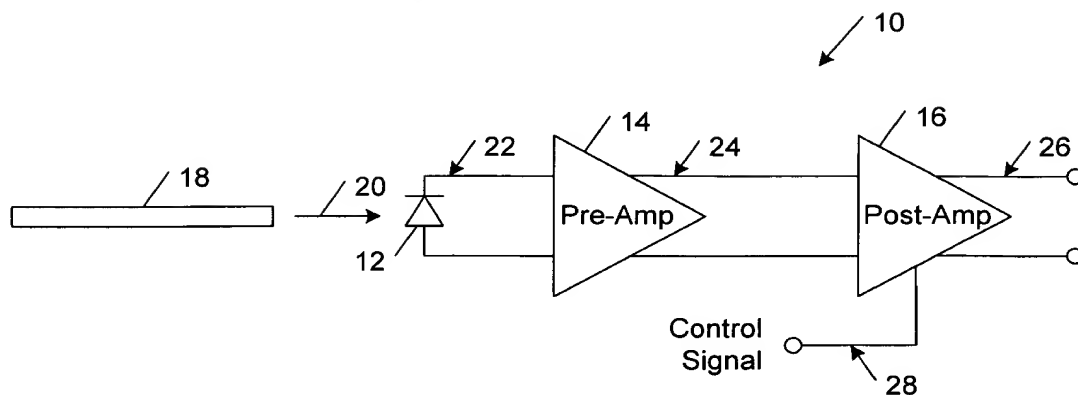
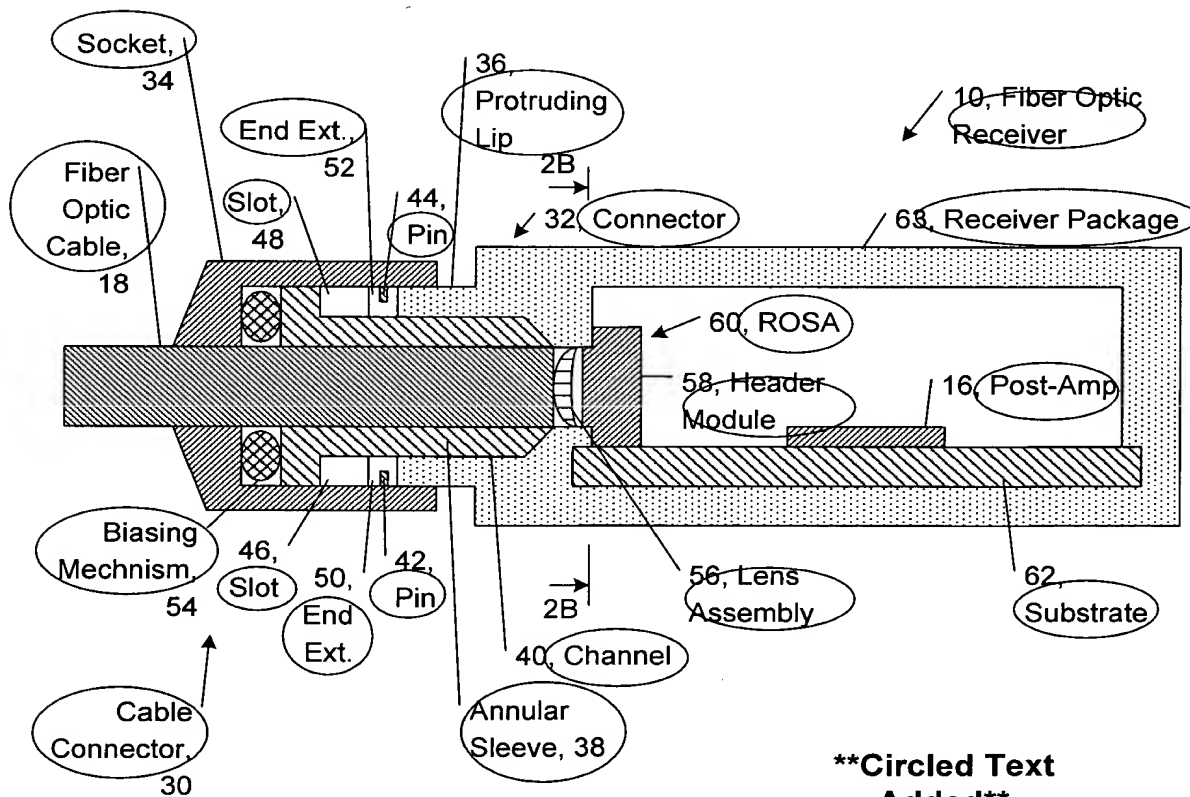


FIG. 1



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FIG. 2A